AVEVA Adapters for MQTT and AVEVA Edge Data Store IIoT configuration workshop

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Goals and takeaways

• Install and configure AVEVA Adapter for MQTT for data collection

• Install and configure AVEVA Edge Data Store for data ingress from the AVEVA Adapter

• Install both components on one Linux server

• Install EdgeCmd Utility and configure AVEVA Adapter to send data to AVEVA Edge Data Store

• Easy to setup and configure

• View the data that is set up for data collection
What is EdgeCmd?

- EdgeCmd is a command line application to configure and/or administer the AVEVA Edge Data Store and the suite of AVEVA Adapters
- EdgeCmd queries are translated to HTTP queries against REST API
- Separate install kit
- Supported on Linux or Windows OS
- Easy to use with facets
- Can also use cURL and/or Postman
What are facets?

- Sections of a configuration to make data collection unique for each adapter component
- Used with a list of operations (help, get, set, edit, add, remove, etc.)
- User-friendly names to help configure adapters easier
- Analogous to the different tabs we find in PI ICU
Different facets available to use

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Pre-requisite

• The following components will be installed:
  • Edge Data Store on port: 5590
  • AVEVA Adapter for MQTT on port 5591
  • EdgeCmd utility
  • MQTT data source on port 1883
• What we will be doing:
  • Configure the adapter to connect to data source and discover for data
  • Configuration will be done using EdgeCmd
  • Use AVEVA Edge Data Store to view the results
Getting started: Installing the AVEVA software components
Getting started: Installing the AVEVA software components

**Installing on Linux:** sudo apt install <filename>

**To verify:** edgecmd get system
Basics steps to configure an AVEVA Adapter

1. Create an AVEVA adapter component
2. Configure a data source
3. Configure egress to the data endpoint (AVEVA™ PI System™, AVEVA Edge Data Store, and AVEVA™ Data Hub)
4. (optional) Configure health endpoints (AVEVA PI System, AVEVA Edge Data Store, and AVEVA Data Hub)
5. (optional) Configure data filtering
6. (optional) Discover data items
7. Configure data selection
8. Confirm data flow
Configuring the AVEVA Adapter

Create an adapter component
ashish@AE-Linux6:~/Desktop/Installers$ [ ]
Configuring the AVEVA Adapter

Create an AVEVA Adapter component

Creating a component: edgecmd add components –type MQTTSparkplugB –id Sparkplug1 –port 5591

To verify: edgecmd get components –port 5591
Configuring the AVEVA Adapter

Configure a data source
Configuring the AVEVA Adapter

Configure a data source

**Configure datasource:** `edgecmd set datasource --cid Sparkplug1 --file DataSource.json --port 5591`

**To verify:** `edgecmd get datasource --cid Sparkplug1 --port 5591`
Configuring the AVEVA Adapter

Configure egress to a data endpoint
Configuring the AVEVA Adapter

Configure egress to data endpoint

**Configure egress endpoint**: `edgcmd set dataEndpoints -file EgressEndpoint.json -port 5591`

**To verify**: `edgcmd get dataendpoints -port 5591`

```
ashish@AE-Linux6:~/Desktop/Installers$ edgcmd get dataendpoints -port 5591
{
   "id": "EDS",
   "endpoint": "http://localhost:5590/api/v1/tenants/default/namespaces/default/omf",
   "userName": "",
   "password": "",
   "clientId": null,
   "clientSecret": null,
   "debugExpiration": null,
   "tokenEndpoint": null,
   "validateEndpointCertificate": true
}
```
Configuring the AVEVA Adapter

(optional) Configure health endpoints
Configuring the AVEVA Adapter

(optional) Configure health endpoints

**Configure health endpoint:** `edgecmd set healthendpoints --file EgressEndpoint.json --port 5591`

**To verify:** `edgecmd get healthendpoints --port 5591`

```bash
ashish@AE-Linux6:~/Desktop/Installers$ edgecmd get healthendpoints -port 5591
[
  {
    "id": "EDS",
    "endpoint": "http://localhost:5590/api/v1/tenants/default/namespaces/default/omf",
    "userName": "",
    "password": "",
    "clientId": null,
    "clientSecret": null,
    "debugExpiration": null,
    "tokenEndpoint": null,
    "validateEndpointCertificate": true
  }
]```
Configuring the AVEVA Adapter

(optional) Configure data filters
(optional) Configure data filtering

**Apply data filter:** `edgecmd set datafilters -cid Sparkplug1 -port 5591 -file DataFilters.json`

**To verify:** `edgecmd get datafilters -cid Sparkplug1 -port 5591`
Configuring the AVEVA Adapter

(optional) Discover data items
ashish@AE-Linux6:~/Desktop/Installers$
Configuring the AVEVA Adapter

(optional) Discover data items

To discover data items: `edgecmd add discoveries --cid Sparkplug1 --id Discovery1 --port 5591`

To verify: `edgecmd get discoveries --cid Sparkplug1 --id Discovery1 --port 5591`

```
ashish@AE-Linux6:/Desktop/Installers$ edgecmd get discoveries -cid Sparkplug1 -id Discovery1 -port 5591
{
    "id": "Discovery1",
    "query": null,
    "startTime": "2023-09-15T07:22:40.7544385-07:00",
    "endTime": "2023-09-15T07:23:40.9011998-07:00",
    "progress": 1,
    "itemsFound": 15,
    "newItems": 15,
    "resultUri": "http://127.0.0.1:5591/api/v1/Configuration/Sparkplug1/Discoveries/Discovery1/result",
    "autoSelect": false,
    "status": "Complete",
    "errors": null
}
```
Configuring the AVEVA Adapter

Configure data selection
ashish@AE-Linux6:~/Desktop/Installers$ edgectl get discoveries -cid Sparkplug1 -id Discovery1 -port 5591
{
  "id": "Discovery1",
  "query": null,
  "startTime": "2023-09-15T07:22:40.7544385-07:00",
  "endTime": "2023-09-15T07:23:40.9011998-07:00",
  "progress": 1,
  "itemsFound": 15,
  "newItems": 15,
  "resultUri": "http://127.0.0.1:5591/api/v1/Configuration/Sparkplug1/Discoveries/Discovery1/result",
  "autoSelect": false,
  "status": "Complete",
  "errors": null
}
ashish@AE-Linux6:~/Desktop/Installers$
Configuring the AVEVA Adapter

Configure data selection

Using discovery for data selection:
edgecmd add dataselection -cid Sparkplug1 -unselect -query discoveryid=Discover1 -port 5591

Outputting discovery results to file:
edgecmd get dataselection -cid Sparkplug1 -port 5591 > MQTTDataSelection.json

To apply data selection contents:
edgecmd set dataselection -cid Sparkplug1 -port 5591 -file MQTTDataSelection.json

To verify:
edgecmd get dataselection -cid Sparkplug1 -port 5591
Configuring the AVEVA Adapter

Confirm data flow
"selected": false,
"name": null,
"streamId": "spBv1.0/My MQTT Group/Edge Node fcfb93.RandomDouble1",
"dataFilterId": null
},
{
"topic": "spBv1.0/My MQTT Group/NDATA/Edge Node fcfb93",
"metricName": "RandomLong2",
"selected": false,
"name": null,
"streamId": "spBv1.0/My MQTT Group/Edge Node fcfb93.RandomLong2",
"dataFilterId": null
},
{
"topic": "spBv1.0/My MQTT Group/NDATA/Edge Node fcfb93",
"metricName": "RandomBoolean2",
"selected": false,
"name": null,
"streamId": "spBv1.0/My MQTT Group/Edge Node fcfb93.RandomBoolean2",
"dataFilterId": null
},
{
"topic": "spBv1.0/My MQTT Group/NDATA/Edge Node fcfb93",
"metricName": "RandomBoolean1",
"selected": false,
"name": null,
"streamId": "spBv1.0/My MQTT Group/Edge Node fcfb93.RandomBoolean1",
"dataFilterId": null
}
Configuring the AVEVA Adapter

Confirm data flow

Open the browser, go to http://localhost:<EDSPort>/api/v1/tenants/default/ namespaces/default/streams/ for all the streams available

Replacing the <StreamId> with a tag name to see data:

http://localhost:<EDSPort>/api/v1/tenants/default/ namespaces/default/streams/<StreamID>/Data/Last

- Can use Grafana, 3rd party tool to visualize the data locally before egress
- Can egress the data to AVEVA PI Server or AVEVA Data Hub to use with their respective suite of software (AVEVA™ PI Vision™ for AVEVA PI Server and trend tool for AVEVA Data Hub)
Configuring the AVEVA Adapter using Postman
Configuring the AVEVA Adapter

POST http://localhost:5590/api/v1/configuration/system/components

Params
Authorization
Headers (8)
Body
Pre-request Script
Tests
Settings

Body:
```
{"componentId": "Sparkplug1",
 "componentType": "MQTTSparkplugB"
}
```

Response

Click Send to get a response
Configuring the AVEVA Adapter

Create an adapter component – Postman

POST

http://localhost:5590/api/v1/configuration/system/components

Body

```
{
  "componentId": "Sparkplug1",
  "componentType": "MQTTSparkplugB"
}
```
Configuring the AVEVA Adapter

Create an adapter component – Postman

GET

http://localhost:5590/api/v1/configuration/system/components

- Params
- Authorization
- Headers (6)
- Body
- Pre-request Script
- Tests
- Settings

This request does not have a body
Configuring the AVEVA Adapter

Configure a data source – Postman

PUT http://localhost:5590/api/v1/configuration/sparkplug1/datasource

```
"HostnameOrIpAddress": "10.4.209.213",
"Port": 1883,
"tls": "None",
"username": "adapter",
"password": "hi3"
```
PUT http://localhost:5950/api/v1/configuration/sparkplug1/datasource

```json
{
    "HostnameOrIpAddress": "10.4.209.213",
    "Port": 1883,
    "tls": "None",
    "username": "adapter",
    "password": "h13"
}
```

Click Send to get a response.
Configuring the AVEVA Adapter

Configure a data endpoint – Postman

PUT http://localhost:5590/api/v1/configuration/omfegress/dataendpoints

```
1
2  
3  
4  
5  
6  
7  
8  
```

```json
{
  "Id": "PI Web API",
  "Endpoint": "https://ae-linux1/piwebapi/omf",
  "username": "adapter",
  "password": "adapter"
}
```
Configuring the AVEVA Adapter

PUT http://localhost:5590/api/v1/configuration/omfegress/dataendpoints

```
{
  "Id": "PI Web API",
  "Endpoint": "https://ae-linux1/piwebapi/omf",
  "username": "adapter",
  "password": "adapter"
}
```

Click Send to get a response
Configuring the AVEVA Adapter

(Optional) Discover data items – Postman

```
POST

http://localhost:5590/api/v1/configuration/sparkplug1/discoveries

Params  Authorization  Headers (8)  Body  Pre-request Script  Tests  Settings

- none
- form-data
- x-www-form-urlencoded
- raw
- binary

Body:

```
{
  "id": "Discovery1"
}
```
Configuring the AVEVA Adapter

POST http://localhost:5590/api/v1/configuration/sparkplug1/discoveries

Body:
```
{  
  "id": "Discovery1"  
}
```

Click Send to get a response
Configuring the AVEVA Adapter

(Optional) Check discovered data items – Postman

1. Get Discovery1 status

```
GET http://localhost:5590/api/v1/configuration/sparkplug1/discoveries/Discovery1
```

2. Get Discovery1 contents

```
GET http://127.0.0.1:5590/api/v1/Configuration/Sparkplug1/Discoveries/Discovery1/result
```
Configuring the AVEVA Adapter
Configuring the AVEVA Adapter

Configure data selection – Postman

```
PUT http://localhost:5590/api/v1/Configuration/Sparkplug1/dataset
dataction

Params  Authorization  Headers (8)  Body  Pre-request Script  Tests  Settings


```
Configuring the AVEVA Adapter

PUT http://localhost:5590/api/v1/Configuration/Sparkplug1/dataselection

```
{
    "topic": "spBv1.0/My MQTT Group/NDATA/Edge Node fcfb93",
    "metricName": "RandomBoolean2",
    "selected": true,
    "name": null,
    "streamId": "spBv1.0/My MQTT Group/Edge Node fcfb93.RandomBoolean2",
    "dataFilterId": null
}
```

Response

Click Send to get a response
Recap

• Learned how to install and configure AVEVA Adapter for MQTT and AVEVA Edge Data Store on a Linux environment

  1. Using edgecmd

  2. Using Postman

• Very easy to configure and implement

• Script-ability + access to deploy on many environments
About us

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Questions?
Please wait for the microphone.
State your name and company.

Please remember to...
Navigate to this session in the mobile app to complete the survey.

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